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BUREAU OF MINES MINERALS YEARBOOK

The Mineral Industry of Delaware



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This publication is a chapter from the current Bureau of Mines Minerals Yearbook, comprising *Volume I, Metals and Minerals*; *Volume II, Area Reports: Domestic*; *Volume III, Area Reports: International*. The separate volumes of the Yearbook are sold by the Superintendent of Documents, Washington, D.C. 20402.

The Mineral Industry of Delaware

This chapter has been prepared under a Memorandum of Understanding between the Bureau of Mines, U.S. Department of the Interior, and the Delaware Geological Survey for collecting information on all nonfuel minerals.

By L. J. Prosser, Jr.¹

The value of construction sand and gravel production in Delaware in 1987 was \$6.4 million. Output and value data for magnesium compounds and greensand, which were also produced, were excluded from the State total to avoid disclosing company proprietary data. Delaware was one of six States producing magnesium compounds and one of only two reporting greensand marl production in 1987.

Trends and Developments.—The introduction of high-tech materials such as new polymer composites presents significant competitive challenges and opportunities in conventional mineral markets according to a U.S. Bureau of Mines report entitled, "The Impact of Advanced Materials on Conventional Nonfuel Mineral Markets: Selected Forecasts for 1990-2000."² The Center for Composite Materials at the University

of Delaware continued research on composites technology that included studies and reports on (1) fracture toughness and fatigue on an alumina-fiber reinforced magnesium metal-matrix composite, (2) cure behavior of thermosetting resin composites, (3) resin impregnation during the manufacturing of composite materials, and (4) diaphragm forming of carbon-fiber-reinforced thermoplastic composite materials. Lanxide Corp., Newark, DE, developed ceramic materials for high-tech applications using an oxidation reaction process. This process allows for the creation of composite materials because some metal remains in the product. Ceramic metal composites are designed for use in materials that have deficiencies in terms of durability, corrosion, temperature resistance, and chemical breakdown.

Table 1.—Nonfuel mineral production in Delaware¹

Mineral	1985		1986		1987	
	Quantity	Value (thousands)	Quantity	Value (thousands)	Quantity	Value (thousands)
Gem stones			NA	\$1	NA	\$1
Marl (greensand) . . . thousand short tons	2	\$29	1	12	W	W
Sand and gravel (construction) . . . do	*1,300	*4,000	1,547	4,156	*2,300	*6,400
Total ²	XX	4,029	XX	4,169	XX	6,401

*Estimated. NA Not available. W Withheld to avoid disclosing company proprietary data. XX Not applicable.

¹Production as measured by mine shipments, sales, or marketable production (including consumption by producers).

²Partial total; excludes values that must be concealed to avoid disclosing company proprietary data.

REVIEW BY NONFUEL MINERAL COMMODITIES

INDUSTRIAL MINERALS

Delaware produced minor quantities of greensand marl, magnesium compounds, and construction sand and gravel compared with national output totals for these commodities. In addition, the State manufactured and processed minerals including gypsum, sulfur, and titanium dioxide. Locations of these operations are listed in table 2.

Construction sand and gravel production is surveyed by the U.S. Bureau of Mines for even-numbered years only. This chapter contains estimates for 1985 and 1987 and actual data for 1986. Data for odd-numbered years are based on annual company estimates.

The construction industry provided the greatest source of demand for nonfuel minerals in the State. Output of 2.3 million short tons of sand and gravel in 1987 was the highest quantity produced since 1973 and reflected the demand generated from

multimillion-dollar construction projects in Dover, Newcastle, Smyrna, and Wilmington. Sand and gravel also was shipped in from other States. In addition, sources outside Delaware provided crushed stone and cement for use in building and road construction.

METALS

Phoenix Steel Corp., Claymont, the State's only raw steelmaking facility, was shut down in February. The firm filed for protection under chapter 11 of the Federal Bankruptcy Code in April, and the plant remained for sale at yearend. The operation contributed an estimated \$60 million to the Claymont area economy in 1986 and employed about 750 workers before closing.

¹State Mineral Officer, Bureau of Mines, Pittsburgh, PA.

²Balarik, R. F., and B. W. Klein. The Impact of Advanced Materials on Conventional Nonfuel Mineral Markets: Selected Forecasts for 1990-2000. BuMines IC 9150, 1987, p. 18.

Table 2.—Principal producers

Commodity and company	Address	Type of activity	County
Greensand:			
Contractors Sand & Gravel Co. Inc. ¹	Box 2630 Wilmington, DE 19805	Pit	New Castle.
Gypsum (calcined):			
Georgia-Pacific Corp., Gypsum Div	Wilmington Marine Terminal Box 310 Wilmington, DE 19899	Plant	Do
Magnesium compounds:			
Barcroft Co.	40 Cape Henlopen Dr Lewes, DE 19958	Plant (pharmaceutical-fine chemical)	Sussex.
Sand and gravel (construction):			
Dover Equipment & Machine Co.	113 West 6th St. New Castle, DE 19720	Dredge	Kent.
Parkway Gravel Inc.	4048 New Castle Ave. New Castle, DE 19720	Pit	New Castle.
Howard L. Ritter & Sons	Box 716 Lewes, DE 19958	Pit	Sussex.
Staytons Sand & Gravel Inc.	Box P Felton, DE 19943	Pit	Kent.
Steel:			
Phoenix Steel Corp.	4001 Philadelphia Pike Claymont, DE 19703	Mill (plate)	Do.
Sulfur (recovered):			
Texaco Inc.	Wrangle Hill Rd. Delaware City, DE 19706	Refinery (petroleum)	Do.
Titanium dioxide:			
E. I. du Pont de Nemours & Co. Inc.	Edgemoor, DE 19809	Plant (chemical)	Do.

¹Also sand and gravel.